

## Full List of Refereed Publications (updated: June, 2025)

### List of Dr. Ue-Li Pen's Refereed Publications ([NASA ADS link](#))

1. Jow, D. L., Pen, U.-L. (2025/04). "Measuring Cosmic Expansion with Diffractive Gravitational Scintillation of Nanohertz Gravitational Waves", *Physical Review Letters*, 134, 131001.
2. Feldbrugge J, Jow DL, Pen U-L, (2025/04). "Complex classical paths in quantum reflections and tunneling", *Physical Review D*, 111, 085027.
3. Hu, W., Wang, Y., Li, Y., et al. (2025/03), "The FAST H I 21 cm Absorption Blind Survey. II. Statistical Exploration for Associated and Intervening Systems", *The Astrophysical Journal Supplement Series*, 277, 25.
4. Röder, J., Wielgus, M., Lobanov, A. P., et al. (2025/03), "A multifrequency study of sub-parsec jets with the Event Horizon Telescope", *Astronomy and Astrophysics*, 695, A233.
5. Tyhurst, E., Padmanabhan, H., **Pen, U.-L.** (2025/02), "Redshift space distortions in Lagrangian space and the linear large scale velocity field of dark matter", *Physical Review D*, 111, 043524.
6. Event Horizon Telescope Collaboration, Akiyama, K., Alentosa-Ruiz, E., et al. (2025/01), "The persistent shadow of the supermassive black hole of M87: II. Model comparisons and theoretical interpretations", *Astronomy and Astrophysics*, 693, A265.
7. Hewitt, D. M., Bhardwaj, M., Gordon, A. C., et al. (2024/12), "A Repeating Fast Radio Burst Source in a Low-luminosity Dwarf Galaxy", *The Astrophysical Journal*, 977, L4.
8. Amiri, M., Chakraborty, A., Foreman, S., et al. (2024/12), "Holographic Beam Measurements of the Canadian Hydrogen Intensity Mapping Experiment (CHIME)", *The Astrophysical Journal*, 976, 163.
9. Baczkó, A.-K., Kadler, M., Ros, E., et al. (2024/12), "The putative center in NGC 1052", *Astronomy and Astrophysics*, 692, A205.
10. Algaba, J. C., Baloković, M., Chandra, S., et al. (2024/12), "Broadband multi-wavelength properties of M87 during the 2018 EHT campaign including a very high energy flaring episode", *Astronomy and Astrophysics*, 692, A140.
11. Cassanelli, T., Leung, C., Sanghavi, P., et al. (2024/11), "A fast radio burst localized at detection to an edge-on galaxy using very-long-baseline interferometry", *Nature Astronomy*, 8, 1429.
12. Lin, H.-H., Scholz, P., Ng, C., et al. (2024/11), "Do All Fast Radio Bursts Repeat? Constraints from CHIME/FRB Far Sidelobe FRBs", *The Astrophysical Journal*, 975, 75.
13. Ding, J., Wang, X., **Pen, U.-L.**, et al. (2024/10), "Correlation-based Beam Calibration of 21 cm Intensity Mapping", *The Astrophysical Journal Supplement Series*, 274, 44.
14. Jow, D. L., Wu, X., **Pen, U.-L.** (2024/09), "Refractive lensing of scintillating FRBs by subparsec cloudlets in the multiphase CGM", *Proceedings of the National Academy of Science*, 121, e2406783121.
15. Raymond, A. W., Doeleman, S. S., Asada, K., et al. (2024/09). "First Very Long Baseline Interferometry Detections at 870  $\mu\text{m}$ ", *The Astronomical Journal*, 168, 130.
16. Tsai, A., Jow, D.L., Baker, D., et al. (2024/08). "Scintillated microlensing: Measuring cosmic distances with fast radio bursts", *Physical Review D*, 110, 043503.
17. Yu, Z., Deng, F., Sun, S., et al. (2024/08). "The FRB-searching Pipeline of the Tianlai Cylinder Pathfinder Array", *Research in Astronomy and Astrophysics*, 24, 085010.
18. Collaboration, C.F., Amiri, M., Andersen, B.C., et al. (2024/07). "Updating the First CHIME/FRB Catalog of Fast Radio Bursts with Baseband Data", *The Astrophysical Journal*, 969, 145.

19. Li, D., & **Pen, U.-L.** (2024/06). "FRBs from rapid spin-down neutron stars", *Monthly Notices of the Royal Astronomical Society*, 531, 2330-2334.
20. Event Horizon Telescope Collaboration, Akiyama, K., Alberdi, A., et al. (2024/04). "First Sagittarius A\* Event Horizon Telescope Results. VII. Polarization of the Ring", *The Astrophysical Journal*, 964, L25.
21. Event Horizon Telescope Collaboration, Akiyama, K., Alberdi, A., et al. (2024/04). "First Sagittarius A\* Event Horizon Telescope Results. VIII. Physical Interpretation of the Polarized Ring", *The Astrophysical Journal*, 964, L26.
22. Amiri, M., Bandura, K., Chakraborty, A., et al. (2024/03). "A Detection of Cosmological 21 cm Emission from CHIME in Cross-correlation with eBOSS Measurements of the Ly $\alpha$  Forest", *The Astrophysical Journal*, 963, 23.
23. Jow, D.L., **Pen, U.-L.**, & Baker, D. (2024/03). "On the cusp of cusps: a universal model for extreme scattering events in the ISM", *Monthly Notices of the Royal Astronomical Society*, 528, 6292-6301.
24. Paraschos, G.F., Kim, J.Y., Wielgus, M., et al. (2024/02). "Ordered magnetic fields around the 3C 84 central black hole", *Astronomy and Astrophysics*, 682, L3.
25. Zang, S.-H., Zhu, H.-M., Schmittfull, M., et al. (2024/02). "Cosmic Tidal Reconstruction in Redshift Space", *The Astrophysical Journal*, 962, 21.
26. Event Horizon Telescope Collaboration, Akiyama, K., Alberdi, A., et al. (2024/01). "The persistent shadow of the supermassive black hole of M 87. I. Observations, calibration, imaging, and analysis", *Astronomy and Astrophysics*, 681, A79.
27. Torne, P., Liu, K., Eatough, R.P., et al. (2023/12). "A Search for Pulsars around Sgr A\* in the First Event Horizon Telescope Data Set", *The Astrophysical Journal*, 959, 14.
28. Event Horizon Telescope Collaboration, Akiyama, K., Alberdi, A., et al. (2023/11). "First M87 Event Horizon Telescope Results. IX. Detection of Near-horizon Circular Polarization", *The Astrophysical Journal*, 957, L20.
29. Roelofs, F., Johnson, M.D., Chael, A., et al. (2023/11). "Polarimetric Geometric Modeling for mm-VLBI Observations of Black Holes", *The Astrophysical Journal*, 957, L21.
30. Baker, D., Briskin, W., van Kerkwijk, M.H., et al. (2023/10). "High-resolution VLBI astrometry of pulsar scintillation screens with the  $\theta - \theta$  transform", *Monthly Notices of the Royal Astronomical Society*, 525, 211-220.
31. Jow, D. L., **Pen, U.-L.**, Feldbrugge, J., "Regimes in astrophysical lensing: refractive optics, diffractive optics, and the Fresnel scale" (2023/10), *Monthly Notices of the Royal Astronomical Society*, 525, 2107-2124.
32. Baker, D., Briskin, W., van Kerkwijk, M. H., et al., "High-resolution VLBI astrometry of pulsar scintillation screens with the  $\theta - \theta$  transform" (2023/10), *Monthly Notices of the Royal Astronomical Society*, 525, 211-220.
33. Lin, R., van Kerkwijk, M. H., Kirsten, F., et al., "The Radio Parallax of the Crab Pulsar: A First VLBI Measurement Calibrated with Giant Pulses" (2023/08), *The Astrophysical Journal*, 952, 161.
34. Hu, W., Wang, Y., Li, Y., et al., "Detections of 21 cm absorption with a blind FAST survey at  $z \leq 0.09$ " (2023/07), *Astronomy & Astrophysics*, 675, A40.
35. Er, X., **Pen, U.-L.**, Sun, X., et al. (2023/07). "Plasma lensing with magnetic field and a small correction to the Faraday rotation measurement", *Monthly Notices of the Royal Astronomical Society*, 522, 3965-3971.
36. Chung, C.L., Inman, D., Wang, X., et al. (2023/06). "Neutrino Mass Constraints from Reconstructing the Large-scale Structure: Systematic Uncertainty", *Research in Astronomy and Astrophysics*, 23,

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37. Prather, B.S., Dexter, J., Moscibrodzka, M., et al. (2023/06). "Comparison of Polarized Radiative Transfer Codes used by the EHT Collaboration", *The Astrophysical Journal*, 950, 35.
38. Zhu, H., Baker, D., **Pen, U.-L.**, et al., "Pulsar Double Lensing Sheds Light on the Origin of Extreme Scattering Events" (2023/06), *The Astrophysical Journal*, 950, 109.
39. Amiri, M., Bandura, K., Chen, T., et al. (2023/04). "Detection of Cosmological 21 cm Emission with the Canadian Hydrogen Intensity Mapping Experiment", *The Astrophysical Journal*, 947, 16.
40. CHIME/FRB Collaboration, Andersen, B.C., Bandura, K., et al. (2023/04). "CHIME/FRB Discovery of 25 Repeating Fast Radio Burst Sources", *The Astrophysical Journal*, 947, 83.
41. Feldbrugge, J., **Pen, U.-L.**, & Turok, N. (2023/04). "Oscillatory path integrals for radio astronomy", *Annals of Physics*, 451, 169255.
42. Lu, R.-S., Asada, K., Krichbaum, T.P., et al. (2023/04). "A ring-like accretion structure in M87 connecting its black hole and jet", *Nature*, 616, 686-690.
43. Lin, R., van Kerkwijk, M.H., Main, R., et al. (2023/03). "Resolving the Emission Regions of the Crab Pulsar's Giant Pulses. II. Evidence for Relativistic Motion", *The Astrophysical Journal*, 945, 115.
44. Jorstad, S., Wielgus, M., Lico, R., et al. (2023/02). "The Event Horizon Telescope Image of the Quasar NRAO 530", *The Astrophysical Journal*, 943, 170.
45. Lin, F.X., Main, R.A., Jow, D., et al. (2023/02). "Plasma lensing near the eclipses of the Black Widow pulsar B1957+20", *Monthly Notices of the Royal Astronomical Society*, 519, 121-135.
46. Jia, H., Zhu, H.-M., & **Pen, U.-L.** (2023/01). "Galaxy Spin Classification. I. Z-wise versus S-wise Spirals with the Chirality Equivariant Residual Network", *The Astrophysical Journal*, 943, 32.
47. Yalinewich, A., & **Pen, U.-L.** (2022/10). "The moving mirror model for fast radio bursts", *Monthly Notices of the Royal Astronomical Society*, 515, 5682-5688.
48. Lin, H.-H., Lin, K.-Y., Li, C.-T., et al. (2022/09). "BURSTT: Bustling Universe Radio Survey Telescope in Taiwan", *Publications of the Astronomical Society of the Pacific*, 134, 094106.
49. Collaboration, C., Amiri, M., Bandura, K., et al. (2022/08). "An Overview of CHIME, the Canadian Hydrogen Intensity Mapping Experiment", *The Astrophysical Journal Supplement Series*, 261, 29.
50. Issaoun, S., Wielgus, M., Jorstad, S., et al. (2022/08). "Resolving the Inner Parsec of the Blazar J1924-2914 with the Event Horizon Telescope", *The Astrophysical Journal*, 934, 145.
51. Jow, D.L., & **Pen, U.-L.** (2022/08). "Measuring lens dimensionality in extreme scattering events through wave optics", *Monthly Notices of the Royal Astronomical Society*, 514, 4069-4077.
52. Kader, Z., Leung, C., Dobbs, M., et al. (2022/08). "High-time resolution search for compact objects using fast radio burst gravitational lens interferometry with CHIME/FRB", *Physical Review D*, 106, 043016.
53. Leung, C., Kader, Z., Masui, K.W., et al. (2022/08). "Constraining primordial black holes using fast radio burst gravitational-lens interferometry with CHIME/FRB", *Physical Review D*, 106, 043017.
54. Broderick, A.E., Gold, R., Georgiev, B., et al. (2022/05). "Characterizing and Mitigating Intraday Variability: Reconstructing Source Structure in Accreting Black Holes with mm-VLBI", *The Astrophysical Journal*, 930, L21.
55. Event Horizon Telescope Collaboration, Akiyama, K., Alberdi, A., et al. (2022/05). "First Sagittarius A\* Event Horizon Telescope Results. VI. Testing the Black Hole Metric", *The Astrophysical Journal*, 930, L17.
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- A\* Event Horizon Telescope Results. V. Testing Astrophysical Models of the Galactic Center Black Hole", *The Astrophysical Journal*, 930, L16.
57. Event Horizon Telescope Collaboration, Akiyama, K., Alberdi, A., et al. (2022/05). "First Sagittarius A\* Event Horizon Telescope Results. IV. Variability, Morphology, and Black Hole Mass", *The Astrophysical Journal*, 930, L15.
  58. Event Horizon Telescope Collaboration, Akiyama, K., Alberdi, A., et al. (2022/05). "First Sagittarius A\* Event Horizon Telescope Results. III. Imaging of the Galactic Center Supermassive Black Hole", *The Astrophysical Journal*, 930, L14.
  59. Event Horizon Telescope Collaboration, Akiyama, K., Alberdi, A., et al. (2022/05). "First Sagittarius A\* Event Horizon Telescope Results. II. EHT and Multiwavelength Observations, Data Processing, and Calibration", *The Astrophysical Journal*, 930, L13.
  60. Event Horizon Telescope Collaboration, Akiyama, K., Alberdi, A., et al. (2022/05). "First Sagittarius A\* Event Horizon Telescope Results. I. The Shadow of the Supermassive Black Hole in the Center of the Milky Way", *The Astrophysical Journal*, 930, L12.
  61. Farah, J., Galison, P., Akiyama, K., et al. (2022/05). "Selective Dynamical Imaging of Interferometric Data", *The Astrophysical Journal*, 930, L18.
  62. Georgiev, B., Pesce, D.W., Broderick, A.E., et al. (2022/05). "A Universal Power-law Prescription for Variability from Synthetic Images of Black Hole Accretion Flows", *The Astrophysical Journal*, 930, L20.
  63. Wielgus, M., Marchili, N., Martí-Vidal, I., et al. (2022/05). "Millimeter Light Curves of Sagittarius A\* Observed during the 2017 Event Horizon Telescope Campaign", *The Astrophysical Journal*, 930, L19.
  64. Motloch, P., **Pen, U.-L.**, & Yu, H.-R. (2022/04). "Observational search for primordial chirality violations using galaxy angular momenta", *Physical Review D*, 105, 083512.
  65. Motloch, P., **Pen, U.-L.**, & Yu, H.-R. (2022/04). "Correlating galaxy shapes and initial conditions: An observational study", *Physical Review D*, 105, 083504.
  66. Zhu, H.-M., Mao, T.-X., & **Pen, U.-L.** (2022/04). "Cosmic Tidal Reconstruction with Halo Fields", *The Astrophysical Journal*, 929, 5.
  67. Baker, D., Brisken, W., van Kerkwijk, M.H., et al. (2022/03). "Interstellar interferometry: precise curvature measurement from pulsar secondary spectra", *Monthly Notices of the Royal Astronomical Society*, 510, 4573-4581.
  68. Wolz, L., Pourtsidou, A., Masui, K.W., et al. (2022/03). "H I constraints from the cross-correlation of eBOSS galaxies and Green Bank Telescope intensity maps", *Monthly Notices of the Royal Astronomical Society*, 510, 3495-3511.
  69. Cassanelli, T., Leung, C., Rahman, M., et al. (2022/02). "Localizing FRBs through VLBI with the Algonquin Radio Observatory 10 m Telescope", *The Astronomical Journal*, 163, 65.
  70. Kirsten, F., Marcote, B., Nimmo, K., et al. (2022/02). "A repeating fast radio burst source in a globular cluster", *Nature*, 602, 585-589.
  71. Marthi, V.R., Bethapudi, S., Main, R.A., et al. (2022/01). "Burst properties of the highly active FRB20201124A using uGMRT", *Monthly Notices of the Royal Astronomical Society*, 509, 2209-2219.
  72. Satapathy, K., Psaltis, D., Özel, F., et al. (2022/01). "The Variability of the Black Hole Image in M87 at the Dynamical Timescale", *The Astrophysical Journal*, 925, 13.
  73. Amiri, M., Andersen, B.C., Bandura, K., et al. (2021/12). "The First CHIME/FRB Fast Radio Burst Catalog", *The Astrophysical Journal Supplement Series*, 257, 59.
  74. Jow, D.L., Lin, F.X., Tyhurst, E., et al. (2021/11). "Imaginary images and Stokes phenomena in the

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75. Lin, F.X., Lin, H.-H., Luo, J., et al. (2021/11). "Profile changes associated with dispersion measure events in PSR J1713+0747", *Monthly Notices of the Royal Astronomical Society*, 508, 1115-1127.
  76. Bij, A., Lin, H.-H., Li, D., et al. (2021/10). "Kinematics of Crab Giant Pulses", *The Astrophysical Journal*, 920, 38.
  77. Marthi, V.R., Simard, D., Main, R.A., et al. (2021/10). "Scintillation of PSR B1508+55 - the view from a 10 000-km baseline", *Monthly Notices of the Royal Astronomical Society*, 506, 5160-5169.
  78. Switzer, E.R., Barrentine, E.M., Cataldo, G., et al. (2021/10). "Experiment for cryogenic large-aperture intensity mapping: instrument design", *Journal of Astronomical Telescopes, Instruments, and Systems*, 7, 044004.
  79. Janssen, M., Falcke, H., Kadler, M., et al. (2021/07). "Event Horizon Telescope observations of the jet launching and collimation in Centaurus A", *Nature Astronomy*, 5, 1017-1028.
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  81. Kocherlakota, P., Rezzolla, L., Falcke, H., et al. (2021/05). "Constraints on black-hole charges with the 2017 EHT observations of M87\*", *Physical Review D*, 103, 104047.
  82. Narayan, R., Palumbo, D.C.M., Johnson, M.D., et al. (2021/05). "The Polarized Image of a Synchrotron-emitting Ring of Gas Orbiting a Black Hole", *The Astrophysical Journal*, 912, 35.
  83. Group, E.M.S.W., Algaba, J.C., Anczarski, J., et al. (2021/04). "Broadband Multi-wavelength Properties of M87 during the 2017 Event Horizon Telescope Campaign", *The Astrophysical Journal*, 911, L11.
  84. Event Horizon Telescope Collaboration, Akiyama, K., Algaba, J.C., et al. (2021/03). "First M87 Event Horizon Telescope Results. VIII. Magnetic Field Structure near The Event Horizon", *The Astrophysical Journal*, 910, L13.
  85. Event Horizon Telescope Collaboration, Akiyama, K., Algaba, J.C., et al. (2021/03). "First M87 Event Horizon Telescope Results. VII. Polarization of the Ring", *The Astrophysical Journal*, 910, L12.
  86. Goddi, C., Martí-Vidal, I., Messias, H., et al. (2021/03). "Polarimetric Properties of Event Horizon Telescope Targets from ALMA", *The Astrophysical Journal*, 910, L14.
  87. Motloch, P., Yu, H.-R., **Pen, U.-L.**, et al. (2021/01). "An observed correlation between galaxy spins and initial conditions", *Nature Astronomy*, 5, 283-288.
  88. Wucknitz, O., Spitler, L.G., & **Pen, U.L.** (2021/01). "Cosmology with gravitationally lensed repeating fast radio bursts", *Astronomy and Astrophysics*, 645, A44.
  89. Marthi, V.R., Gautam, T., Li, D.Z., et al. (2020/12). "Detection of 15 bursts from the fast radio burst 180916.J0158+65 with the upgraded Giant Metrewave Radio Telescope", *Monthly Notices of the Royal Astronomical Society*, 499, L16-L20.
  90. CHIME/FRB Collaboration, Andersen, B.C., Bandura, K.M., et al. (2020/11). "A bright millisecond-duration radio burst from a Galactic magnetar", *Nature*, 587, 54-58.
  91. Jow, D.L., Foreman, S., **Pen, U.-L.**, et al. (2020/10). "Wave effects in the microlensing of pulsars and FRBs by point masses", *Monthly Notices of the Royal Astronomical Society*, 497, 4956-4969.
  92. Psaltis, D., Medeiros, L., Christian, P., et al. (2020/10). "Gravitational Test beyond the First Post-Newtonian Order with the Shadow of the M87 Black Hole", *Physical Review Letters*, 125, 141104.
  93. Li, J., Zuo, S., Wu, F., et al. (2020/09). "The Tianlai Cylinder Pathfinder array: System functions and basic performance analysis", *Science China Physics, Mechanics, and Astronomy*, 63, 129862.

94. Wielgus, M., Akiyama, K., Blackburn, L., et al. (2020/09). "Monitoring the Morphology of M87\* in 2009-2017 with the Event Horizon Telescope", *The Astrophysical Journal*, 901, 67.
95. Kim, J.-Y., Krichbaum, T.P., Broderick, A.E., et al. (2020/08). "Event Horizon Telescope imaging of the archetypal blazar 3C 279 at an extreme 20 microarcsecond resolution", *Astronomy and Astrophysics*, 640, A69.
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98. Keating, L.C., & **Pen, U.-L.** (2020/07). "Exploring the dispersion measure of the Milky Way halo", *Monthly Notices of the Royal Astronomical Society*, 496, L106-L110.
99. Chime/Frb, C., Amiri, M., Andersen, B.C., et al. (2020/06). "Periodic activity from a fast radio burst source", *Nature*, 582, 351-355.
100. Roelofs, F., Janssen, M., Natarajan, I., et al. (2020/04). "SYMBA: An end-to-end VLBI synthetic data generation pipeline. Simulating Event Horizon Telescope observations of M 87", *Astronomy and Astrophysics*, 636, A5.
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102. Yu, H.-R., Motloch, P., **Pen, U.-L.**, et al. (2020/03). "Probing Primordial Chirality with Galaxy Spins", *Physical Review Letters*, 124, 101302.
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110. Porth, O., Chatterjee, K., Narayan, R., et al. (2019/08). "The Event Horizon General Relativistic Magnetohydrodynamic Code Comparison Project", *The Astrophysical Journal Supplement Series*, 243, 26.
111. Li, D., Zhu, H.-M., & **Pen, U.-L.** (2019/07). "Cross-correlation of the kinematic Sunyaev-Zel'dovich effect and 21 cm intensity mapping with tidal reconstruction", *Physical Review D*, 100, 023517.
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119. Event Horizon Telescope Collaboration, Akiyama, K., Alberdi, A., et al. (2019/04). "First M87 Event Horizon Telescope Results. I. The Shadow of the Supermassive Black Hole", *The Astrophysical Journal*, 875, L1.
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